

REMARKS

Claims 21 and 22 have been rewritten in independent form as new claims 23 and 24. New claims 23 and 24 limit the hydrotreating catalyst in the at least six catalyst layers to one which consists of, as metal components, MoO₃ and NiO, supported on an alumina carrier.

New claims 23 and 24 are allowable. In the submission filed with the RCE on May 12, 2003, applicants argued that claims 21 and 22, which limited the number of catalyst layers to at least six layers, were non-obvious over the prior art. Applicants noted that the data of the Example and Comparative Example of the present specification showed that a catalyst system composed of at least six catalyst layers packed, respectively, with hydrotreating catalysts satisfying the specific requirements of the claims, exhibited an unexpected enhanced activity over a prolonged period as compared with a catalyst system composed of three catalyst layers packed respectively with the same hydrotreating catalysts satisfying the same requirements.

In the Action of May 27, 2003, the Office, in response to the assertion in the submission of unexpected results from the use of

a six-layer system, states:

"The assertion of unexpected results from the use of a six-layer system is nor persuasive because the example in the specification is not commensurate in scope with the claimed invention. The example uses specific catalysts. However, the claims are not limited to these catalysts."

(Page 6, lines 8-11). Claims 23 and 24 are limited to the catalyst of the example. The showing of unexpected results, therefore, is commensurate in scope with claims 23 and 24. An allowance of these claims is in order.

Reconsideration and removal of the 35 U.S.C. § 103(a) rejections in the Action of the other claims pending in the application are also respectfully requested. The Office's case of prima facie obviousness of these claims is insufficient as a matter of law.

It is well-established that where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under § 103 requires, inter alia, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed

that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success. *See In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. *Id.*

The first factor has been interpreted as a requirement for a suggestion, teaching, or motivation to combine the prior art references. *See C.R. Bard, Inc. v. M3 Sys. Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998). Evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness is required. *See, e.g., McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). Moreover, the showing of the requisite suggestion or motivation must be specific. *See, e.g., In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed").

(Emphasis added).

In the present case, the Office has not provided a proper showing of why the art-skilled person, without knowledge of the present application, would have modified Angevine as proposed in the Action.

First, regarding the alleged obviousness of using at least four catalyst layers satisfying the claimed relationship, Angevine concretely discloses no relationship represented by the formula of $1.15V_n \geq V_{n+1}$, wherein V represents the pore volume per cubic meter of each catalyst layer, as recited in the rejected claims. The Office's position is that this relationship is inherent in the three stage catalyst system disclosed in Table I of Angevine. However, the data of Table 1 do not enable a person of ordinary skill in the art to calculate the pore volume per cubic meter of each catalyst layer. Therefore, the Office's conclusion is necessarily a matter of probability, possibility or conjecture.

Even if the three stage catalyst system of Angevine would somehow be understood to satisfy the claimed relationship regarding pore volume per cubic meter of each catalyst layer, the prior art must also provide a proper motive to modify the three stage system

of Angevine so as to provide a four or more stage system which satisfies the claimed relationships. In the present case, the Office argues that the necessary motive is provided "because the disclosure of three or more layers coupled with the disclosure of a three catalyst system satisfying the claimed relationships would result in the expectation that the use of a four or more layer catalyst system would be effective for hydroprocessing hydrocarbons." (Action, page 3, lines 3-6 from the bottom of the page).

This statement on its face demonstrates the lack of proper motivation to modify the system of Angevine so as to satisfy the claimed relationship regarding pore volume per cubic meter of each catalyst layer because there is no disclosure of a three catalyst system satisfying the claimed relationships. Therefore, the person of ordinary skill in the art does not know that the three stage catalyst system of Angevine satisfies the relationship $1.15V_n \geq V_{n+1}$. A motivation to select a fourth catalyst layer which satisfies a specific relationship cannot exist if that relationship is not known. As noted above, the Federal Circuit has held that particular findings must be made as to the reason the skilled

artisan, with no knowledge of the claimed invention, would have selected the components for combination in the manner claimed. The Office, however, has provided no particular findings as to why the skilled artisan, with no knowledge of the present invention and no disclosure in the prior art of the desirability of providing at least four catalyst layers that satisfy the relationships $S_n \leq S_{n+1}$ and $1.15V_n > V_{n+1}$, would have selected a fourth catalyst layer that satisfied these relationships. Again, the art does not disclose that the three stage catalyst of Angevine satisfies the claimed relationship.

In the absence of particular findings as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected a specific fourth catalyst layer that satisfies the claimed relationships, the 35 U.S.C. § 103(a) rejections are improper and must be removed.

Regarding the claimed amount of catalyst in each layer recited in claims 1 and 10, neither Angevine nor any of the other cited references discloses or suggests this limitation. The Office does not allege that the other publications cited in the Action (Frye et al., Gardner et al. and Savage et al.) disclose the claimed amount

of catalyst in each layer. Instead, it is the position of the Office that "one of ordinary skill in the art would utilize amounts that result in effective hydrotreating". However, the materiality of the amount of catalyst recited in claims 1 and 10 is nowhere disclosed or suggested in any of the cited references. As described on page 15, lines 8 to 14, of the present specification, when the amount of catalyst in a layer is less than 3 % by volume, the desulfurization or the demetalization will be unsatisfactory, while when it exceeds 70 % by volume, the amount of the catalysts packed into the other layers will be so small that the advantageous effect attained will also be poor unfavorably. The prior art fails to enable the art-skilled person to reasonably predict such disadvantages, i.e., to reasonably predict the advantages of said amount of catalyst in each layer. Obviousness must come from within the teachings of the prior art. Therefore, the second requirement for prima facie obviousness is lacking. For this reason also, the 35 U.S.C. § 103(a) rejections are improper and should be removed.

Savage et al. has been cited in the Action as disclosing that hydrodesulfurization catalysts may utilize certain supports. The

process of the present invention, however, is directed to producing ultralow sulfur heavy oil. Savage et al., on the other hand, is uses distillate streams boiling in the range of about 175 to 400°C. In view of this difference, the Office, in the absence of proper reasoning or evidence, cannot properly take the position that a person of ordinary skill in the art would reasonably expect the teachings relating to the catalysts of Savage et al. to apply to the catalysts used in the process of Angevine.

The combination of Angevine and Savage et al., therefore, does not support the 35 U.S.C. § 103(a) rejection.

The foregoing is believed to be a complete and proper response to the Office Action dated May 27, 2003, and is believed to place this application in condition for allowance. If, however, minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 111833.

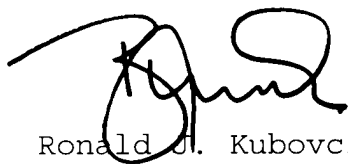
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RESPONSE UNDER 37 C.F.R. §1.111

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NON-FINAL**

In the event any additional fees are required, please also
charge our Deposit Account No. 111833.

Respectfully submitted,

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